



DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Centers for Disease Control  
Atlanta GA 30333

Mr. Fredrick Waring  
Newark Community Project for People With AIDS  
P.O. Box 1241  
Newark, New Jersey 07101

Dear Mr. Waring:

Thank you for your letter requesting information about human immunodeficiency virus (HIV) infection and acquired immunodeficiency syndrome (AIDS).

I am enclosing a copy of the June 15 issue of the Morbidity and Mortality Weekly Report which contains the article, "HIV-Related Knowledge and Behaviors Among High School Students - Selected U.S. Sites, 1989." Also enclosed is a reprint of an article entitled "Methods of Surveillance for HIV Infection at U.S. Sentinel Hospitals" (Public Health Reports, March-April 1990;105:140-146) which describes the methodology used in the sentinel hospital surveillance study. Results from the study are expected to be published in the New England Journal of Medicine in late July.

The Centers for Disease Control is only one of several Federal agencies which provide funding to States for AIDS-related services. You should be able to obtain the information you are seeking regarding Federal funding by contacting the New Jersey Department of Health, Division of AIDS Prevention (CN360), 363 W. State Street, Trenton, New Jersey 08625, telephone (609)984-6000.

Sincerely yours,

Gary R. Noble, M.D.  
Assistant Surgeon General  
Deputy Director (HIV)

Enclosures

### Current Trends

#### **HIV-Related Knowledge and Behaviors Among High School Students — Selected U.S. Sites, 1989**

Since 1987, state, territorial, and local departments of education have periodically assessed human immunodeficiency virus (HIV)-related knowledge and behaviors among high school students (13–18 years of age) in their jurisdictions (1). This report presents selected data from surveys conducted by departments of education in 30 states, 10 cities, and two territories during February–May 1989.

A questionnaire for anonymous self-administration was developed by representatives from 71 state, territorial, and local departments of education, with technical assistance from CDC. The questionnaire contained 39 questions: five for assessing demographic characteristics of respondents, 26 for HIV-related knowledge and beliefs, and eight for intravenous (IV)-drug use and sexual behaviors. Each department of education chose which of the 39 questions to administer; all sites administered questions that assessed demographic characteristics and HIV-related knowledge and beliefs; 25 sites, questions that assessed IV-drug-use behaviors; and 19 sites, questions that assessed sexual behaviors.

Sampling schemes varied among the 42 sites. Eleven sites\* drew probability samples from well-defined sampling frames of schools and students, which allowed weighted results of known precision to be computed. Ten sites† also drew probability samples of both schools and students. However, documentation necessary to weight the data or to estimate precision was not available. In general, the 21 other sites‡ drew nonprobability samples of either schools or students.

School response rates ranged from 27% to 100%; student response rates ranged from 41% to 92%. Sample sizes ranged from 303 to 10,279 students (Table 1). From 33% to 86% (median: 62%) of students from all sites reported having been taught about acquired immunodeficiency syndrome (AIDS) or HIV infection in school. The percentage of students from all sites who reported having discussed AIDS or HIV infection with their parents or other adults in their families ranged from 43% to 69% (median: 56%).

\*Delaware, District of Columbia, Hawaii, Iowa, Kentucky, Massachusetts, Pennsylvania, and South Dakota; Dallas, Jersey City, and Miami.

†Alabama, Arkansas, California, Louisiana, Michigan, Missouri, Oregon, and Rhode Island; Chicago and Seattle.

‡Colorado, Georgia, Idaho, Kansas, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, Puerto Rico, Tennessee, Utah, Virgin Islands, and Washington; Fort Lauderdale, Los Angeles, New York City, San Diego, and San Francisco.

Pennsylvania <sup>†††</sup>	4,548	89	82 <sup>†</sup>	52	48	29	23	26	22	11	80	6	1	2
Puerto Rico <sup>†</sup>	984	95	92	57	43	32	25	24	20	1	5	90	0	3
Rhode Island <sup>*</sup>	7,076	100	77	NA	NA	0	100	0	0	4	82	7	3	4
South Dakota <sup>††</sup>	1,392	90	87	49	51	28	23	25	24	1	82	3	1	13
Tennessee <sup>†</sup>	2,098	80	NA	55	45	21	30	26	24	12	84	3	1	1
Utah <sup>†</sup>	4,174	NA	NA	49	51	28	26	26	21	1	86	6	1	6
Virgin Islands <sup>†</sup>	1,147	100	NA	53	48	42	38	13	4	83	2	12	1	3
Washington <sup>††</sup>	1,176	49	NA	53	47	0	45	0	54	NA	NA	NA	NA	NA
City														
Chicago <sup>*</sup>	1,171	89	90 <sup>†</sup>	57	43	34	29	18	18	62	10	22	3	3
Dallas <sup>††</sup>	3,483	100	87	53	47	26	48	18	9	51	19	25	2	3
Fort Lauderdale <sup>†</sup>	861	100	90	51	49	59	22	9	10	26	58	12	2	3
Jersey City <sup>††</sup>	493	100	70	45	56	57	33	6	4	39	9	30	11	2
Los Angeles <sup>†</sup>	3,030	100	90 <sup>†</sup>	47	53	0	85	12	3	16	17	45	17	5
Miami <sup>††</sup>	1,192	100	83	51	49	32	25	23	21	43	13	40	2	2
New York City <sup>†</sup>	1,135	50	NA	54	46	31	20	32	17	NA	NA	NA	NA	NA
San Diego <sup>†</sup>	317	100	61	61	39	1	95	4	1	13	35	24	22	5
San Francisco <sup>†</sup>	793	94	NA	54	46	2	69	24	6	12	15	11	56	7
Seattle <sup>*</sup>	1,374	100	67	52	49	51	13	9	27	23	45	7	22	5

<sup>\*</sup>Probability sample, unweighted data.

<sup>†</sup>Estimated response rate.

<sup>††</sup>Surveys did not include students from the largest cities.

<sup>†††</sup>Nonprobability sample, unweighted data.

<sup>\*\*</sup>NA = not available.

<sup>†††</sup>Probability sample, weighted data.

<sup>††††</sup>Categorized as a state for funding purposes.

Varying proportions of students knew that AIDS or HIV infection cannot be transmitted by blood donation (32%–75% [median: 58%]), mosquito or other insect bites (22%–67% [median: 48%]), use of public toilets (44%–85% [median: 73%]), or blood tests (59%–82% [median: 73%]). Most students knew that AIDS or HIV infection can be transmitted by sharing needles used to inject drugs (93%–100% [median: 98%]) or from having sexual intercourse without using a condom (74%–98% [median: 88%]) (Table 2).

Rates of reported IV-drug use varied: 2%–5% of students (median: 3%) reported ever injecting cocaine, heroin, or other illegal drugs, and 0.2%–3% (median: 0.9%) reported sharing needles used to inject any drugs. In all but one site, more male than female students reported these behaviors (Table 3, page 395).

Rates of reported sexual intercourse also varied: 27%–76% of students (median: 56%) reported having had sexual intercourse at least once. In addition, 7%–40% (median: 21%) reported ever having had four or more sex partners. At each site, more male than female students reported having had sexual intercourse at least once and ever having had four or more sex partners (Table 4, page 396).

*Reported by:* S. Adams, Alabama State Dept of Education; M. Towery, Arkansas Dept of Education; R. Rich, Los Angeles Unified School Dist; J. Campana, San Diego Unified School Dist; M. Lam, San Francisco Unified School Dist; W. White, California State Dept of Education; D. Sandau-Christopher, State of Colorado Dept of Education; J. Arns, Delaware State Dept of Public Instruction; J. Sadler, District of Columbia Public Schools; G. Davis, Georgia Dept of Education; A. Horiuchi, Hawaii Dept of Education; J. Hummer, Idaho Dept of Education; J. Harris, Iowa Dept of Education; J. Grosko, Kansas State Dept of Education; I. Mudd, Kentucky Dept of Education; D. Frost, Louisiana State Dept of Education; J. Cohen, Massachusetts Dept of Education; W. Jubb, Michigan Dept of Education; C. Hungerford, Missouri Dept of Elementary and Secondary Education; D. Chioda, Jersey City Board of Education; D. Cole, New Jersey State Dept of Education; K. Gaylord, New Mexico State Dept of Education; G. Abelson, New York City Board of Education; A. Sheffield, New York State Education Dept; R. Frye, North Carolina Dept of Public Instruction; C. DeRemer, North Dakota Dept of Public Instruction; K. Stofisick, Ohio Dept of Education; J. Richter, Oklahoma State Dept of Education; J. Warren, Oregon Dept of Education; M. Sutter, Pennsylvania Dept of Education; E. Rosado, Puerto Rico Dept of Education; A. Ferreira, Rhode Island Dept of Education; M. Carr, South Dakota Dept of Education and Cultural Affairs; E. Word, Tennessee State Dept of Education; M. Peterson, Utah State Board of Education; S. Tye, Dept of Education, Government of the Virgin Islands; P. Hillard, Seattle Public Schools; P. Baldwin, Washington State Education Dept; B. Johnson Biehr, Chicago Public Schools, Illinois; D. Scalise, The School Board of Broward County; AN Gay, The School Board of Dade County, Florida; P. Simpson, Dallas Independent School Dist, Texas; Div of Adolescent and School Health, Center for Chronic Disease Prevention and Health Promotion, CDC.

**Editorial Note:** From 1988 to 1989, the number of state, territorial, and local departments of education that conducted surveys about HIV-related knowledge and behaviors among high school students nearly tripled (from 15 to 42). This increase represents a notable step toward establishment of state, territorial, and local school-based surveillance systems for monitoring priority health-risk behaviors among high school students.

HIV-related knowledge and behaviors among high school students are cause for concern throughout the United States. Most importantly, these surveys indicate that many students are at risk for HIV infection because they use IV drugs and share needles or because they have sexual intercourse with multiple partners. Many of these findings are similar to those from surveys conducted in 1988 (7).

Although the findings in this report are based on a combination of probability and nonprobability samples and comparisons of data among sites should be made with caution, these results have assisted in planning and evaluating broad programs in

TABLE 2. Percentage of students who responded correctly to questions measuring knowledge of HIV transmission -- selected U.S. sites, 1989

Site	Correctly identified as nonrisk factor for HIV (%)				Correctly identified as risk factor for HIV (%)	
	Giving blood	Insect bites	Using public toilets	Having a blood test	Intravenous- drug use	Sexual intercourse without using a condom
State/Territory						
Alabama*	61.1	43.2	67.5	76.9	98.6	88.4
Arkansas*	63.3	44.0	68.9	72.5	99.0	93.7
California**	55.6	42.3	72.2	70.8	97.7	84.7
Colorado <sup>1</sup>	52.0	45.6	82.6	69.8	99.0	93.5
Delaware <sup>1</sup>	71.6	49.6	69.1	77.2	98.1	96.2
District of Columbia <sup>1,2</sup>	49.0	44.2	70.9	68.3	95.7	86.6
Georgia <sup>1</sup>	57.0	45.3	73.0	68.5	99.0	99.1
Hawaii <sup>1</sup>	51.7	64.0	82.5	72.5	96.6	94.7
Idaho <sup>1</sup>	54.3	43.3	75.5	67.4	97.8	92.2
Iowa <sup>1</sup>	60.9	45.3	79.2	74.2	97.6	90.8
Kansas <sup>1</sup>	64.7	58.0	80.1	72.8	98.5	92.2
Kentucky <sup>1</sup>	62.3	54.8	71.0	74.6	96.3	84.3
Louisiana*	58.2	50.1	66.8	71.2	96.6	NA <sup>11</sup>
Massachusetts <sup>11</sup>	66.5	54.3	76.6	76.3	99.2	93.4
Michigan*	68.1	48.0	72.1	76.4	97.0	83.7
Missouri <sup>1</sup>	61.3	44.2	73.9	73.4	97.6	96.7
New Jersey <sup>15</sup>	61.4	50.6	73.2	73.1	98.4	89.5
New Mexico <sup>1</sup>	55.9	50.7	75.2	72.0	97.2	87.0
New York <sup>15</sup>	58.0	58.4	81.3	74.6	98.7	90.6
North Carolina <sup>1</sup>	52.8	57.6	75.7	75.3	98.0	85.2
North Dakota <sup>1</sup>	63.7	57.6	84.2	80.3	98.9	89.6
Ohio <sup>1</sup>	64.1	50.2	75.1	73.8	98.7	92.8
Oklahoma <sup>1</sup>	60.2	55.6	76.1	75.5	98.0	91.5
Oregon*	68.6	47.5	72.4	75.8	97.6	90.8
Pennsylvania <sup>15</sup>	71.9	54.8	76.4	77.7	98.4	94.9
Puerto Rico <sup>1</sup>	43.3	21.7	44.4	67.1	97.7	96.3
Rhode Island*	69.9	63.9	NA	80.3	94.6	NA
South Dakota <sup>1</sup>	60.9	48.4	80.1	72.1	99.1	87.2
Tennessee <sup>1</sup>	65.3	43.2	66.6	74.6	97.9	87.6
Utah <sup>1</sup>	54.7	48.8	70.1	69.1	97.2	92.3
Virgin Islands <sup>1</sup>	39.0	47.0	61.3	80.1	95.4	76.1
Washington <sup>15</sup>	74.5	66.5	84.3	82.4	98.7	98.3
City						
Chicago*	39.9	41.9	70.5	64.8	94.9	79.7
Dallas <sup>1</sup>	54.1	55.5	76.4	74.1	97.3	77.6
Fort Lauderdale <sup>1</sup>	49.0	45.2	66.7	67.7	98.7	79.2
Jersey City <sup>1</sup>	32.4	43.9	59.0	63.2	94.7	73.8
Los Angeles <sup>1</sup>	37.9	29.0	52.1	58.5	93.9	74.5
Miami <sup>1</sup>	42.1	45.6	70.3	68.6	97.4	87.6
New York City <sup>1</sup>	33.6	52.9	71.0	64.2	97.2	76.9
San Diego <sup>1</sup>	61.8	58.7	84.9	79.4	99.7	98.4
San Francisco <sup>1</sup>	47.7	41.7	68.8	63.4	93.0	86.4
Seattle*	56.4	48.5	75.7	70.7	97.9	86.7

\*Probability sample, unweighted data.

<sup>1</sup>Surveys did not include students from the largest cities.

<sup>15</sup>Nonprobability sample, unweighted data.

<sup>16</sup>Probability sample, weighted data.

\*\*Categorized as a state for funding purposes.

<sup>11</sup>NA = not available.

individual cities and states. For example, the Michigan Department of Education used results from its 1988 and 1989 surveys to assist the State Board of Education in supporting school-based HIV education programs that help students avoid behaviors that result in HIV infection.

TABLE 3. Percentage of students who reported ever having used intravenous (IV) drugs or ever having shared needles for injecting drugs, by sex — selected U.S. sites, 1989

Site	IV-drug use (%)			Sharing needles (%)		
	Total	Sex		Total	Sex	
		Female	Male		Female	Male
State/Territory						
California**†	2.3	1.1	3.9	1.0	0.3	1.8
Colorado*†	3.0	2.3	3.9	0.9	0.8	0.9
Delaware†	3.8	2.8	4.9	1.7	1.3	2.0
District of Columbia**	2.6	1.5	3.9	0.9	0.2	1.7
Hawaii†	4.9	2.9	6.7	2.0	1.0	3.0
Iowa†	3.7	2.2	5.3	1.8	1.4	2.2
Massachusetts**†	1.6	0.9	2.3	0.5	0.1	0.9
Michigan† ‡	4.0	1.8	6.2	1.3	0.2	2.3
Missouri†	2.4	0.7	4.3	1.3	0.3	2.1
New Jersey**	2.9	1.5	4.1	0.7	0.0	1.3
New Mexico†	2.8	1.4	4.6	0.5	0.2	1.2
North Carolina†	2.4	1.7	3.2	1.3	0.9	1.6
Ohio†	2.2	1.5	3.0	0.6	0.3	0.9
Oklahoma†	5.1	3.5	6.7	1.7	1.1	2.2
Oregon†	5.4	3.6	7.1	2.8	1.5	4.0
Pennsylvania**	3.8	2.6	5.0	0.8	0.4	1.3
Puerto Rico†	1.5	1.1	1.9	0.2	0.0	0.5
Tennessee†	3.2	2.1	4.6	0.9	0.4	1.4
Virgin Islands†	4.1	2.7	5.6	2.4	1.5	3.3
City						
Dallas†	3.0	2.0	4.0	0.7	0.3	1.1
Jersey City†	3.6	4.9	2.3	0.7	0.5	0.8
Miami†	2.2	1.1	3.2	0.7	0.5	0.9
San Diego†	3.5	2.1	5.9	1.9	1.6	2.5
San Francisco†	2.7	2.2	3.2	1.3	0.5	2.3
Seattle†	2.9	2.2	3.6	0.9	0.9	1.0

\*Surveys did not include students from the largest cities.

†Probability sample, unweighted data.

‡Nonprobability sample, unweighted data.

§Probability sample, weighted data.

\*\*Categorized as a state for funding purposes.

In addition to determining the prevalence of HIV-related risk behaviors among high school students, surveys of this type should be used to measure the prevalence of other priority health-risk behaviors, such as drug, alcohol, and tobacco use; imprudent dietary patterns; inadequate physical activity; behaviors that result in intentional and unintentional injuries; and sexual intercourse that can result in sexually transmitted diseases or unintended pregnancies. State, territorial, and local departments of education have worked with CDC and other federal agencies to develop the Youth Risk Behavior Surveillance System. This system, implemented in 1990, will be used to periodically measure changes in these priority health-risk behaviors. To increase the number of sites with probability samples of ninth- through 12th-grade students and the comparability of data among sites, CDC is providing intensive technical assistance to interested departments of education. Departments of education can use the results from these surveys to plan and evaluate comprehensive school health education programs that help students avoid these priority health-risk behaviors.

#### Reference

1. CDC. HIV-related beliefs, knowledge, and behaviors among high school students. MMWR 1988;37:717-21.

TABLE 4. Percentage of students who reported ever having had sexual intercourse or ever having had four or more sex partners, by sex — selected U.S. sites, 1989

Site	Sexual intercourse (%)			≥4 Sex partners (%)		
	Sex			Sex		
	Total	Female	Male	Total	Female	Male
<b>State/Territory</b>						
California <sup>a</sup>	48.1	42.9	54.8	15.1	9.9	21.7
Colorado <sup>a</sup>	58.4	54.0	63.5	22.9	18.4	28.0
Delaware <sup>c</sup>	63.8	65.7	72.6	28.8	19.6	38.3
District of Columbia <sup>a**</sup>	75.5	63.9	89.5	40.0	17.9	66.6
Iowa <sup>a</sup>	55.5	49.4	59.5	20.3	14.7	24.5
Massachusetts <sup>a</sup>	52.3	46.7	58.5	15.6	10.3	21.4
Michigan <sup>d</sup>	62.8	56.6	69.3	23.7	14.2	33.9
New Mexico <sup>b</sup>	54.6	48.6	62.2	20.8	12.2	31.7
Oklahoma <sup>b</sup>	59.6	54.4	65.4	26.3	18.1	35.3
Pennsylvania <sup>a</sup>	56.2	54.4	58.1	20.5	16.2	24.9
Puerto Rico <sup>b</sup>	26.5	11.2	47.6	6.5	0.7	14.6
Tennessee <sup>b</sup>	58.7	53.8	64.9	21.9	13.3	32.7
Virgin Islands <sup>b</sup>	54.3	34.9	78.1	24.9	5.4	49.1
<b>City</b>						
Dallas <sup>c</sup>	62.4	50.5	75.8	29.5	14.9	46.0
Jersey City <sup>c</sup>	55.2	41.6	68.3	21.0	3.7	37.6
Miami <sup>c</sup>	58.6	42.6	76.3	24.1	9.0	40.4
San Diego <sup>d</sup>	39.1	34.6	45.7	13.9	8.7	21.6
San Francisco <sup>b</sup>	30.0	24.7	36.1	9.9	5.7	15.4
Seattle <sup>c</sup>	48.5	40.3	57.2	19.9	10.7	30.0

<sup>a</sup>Surveys did not include students from the largest cities.

<sup>b</sup>Probability sample, unweighted data.

<sup>c</sup>Nonprobability sample, unweighted data.

<sup>d</sup>Probability sample, weighted data.

<sup>\*\*</sup>Categorized as a state for funding purposes.